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Sensors for work safety

Switches provide more safety in the workplace

The Wuppertal-based organisation Schmersal offers its customers, according to its own figures, the world's largest programme of safety switchgear and systems for the protection of personnel and machines. A special application is seen particularly in packaging technology, as here the machines and plants work at high speeds.

Today the specialist for machine safety has over 25,000 products in its range, these include safety switches, safety interlocks and safety sensors, light barriers as well as emergency stop buttons and other controls with safety function.

In addition, safety relay modules and programmable safety controllers for various sectors are developed and produced. With seven manufacturing sites on three continents as well as wholly-owned subsidiaries and sales partners in more than 60 countries, the organisation is present around the world. "Our corporate strategy includes continuous further development.

As such Schmersal has developed from a pure component manufacturer to a provider of sector-orientated safety systems and solutions", says Siegfried Rüttger, Sector Manager Packaging at K. A. Schmersal. "Today a high level of safety is required particularly in packaging technology, as here the machines often work at very high speed. Above all the issue is the protection of the workers, however it is also necessary to ensure smooth production processes and meet the high hygiene requirements in this sector. Here we offer suitable solutions." The company founded immediately after the Second World War by the brothers Kurt Andreas and Ernst Schmersal initially produced household electrical goods. A waffle iron from this time can still be seen today in the foyer of the main administration building in Wuppertal.

Mechanical switchgear for industrial applications soon followed, for instance limit switches for construction machinery as well as components for elevator manufacture. In the 70s the Wuppertal-based organisation was one of the first businesses to develop electronic proximity switches, the predecessors of modern, contactless safety switchgear that is in strong demand in the food and packaging industry today.

For more than 70 years

The family business pressed ahead with internationalisation at an early stage and, as early as 1974, founded its first foreign subsidiary in Sao Paulo/Brazil. As a sales and production organisation, ACE Schmersal today manufactures switchgear for the entire South American market on the Boituva site near Sao Paulo with around 400 employees.

A production facility in Shanghai/China followed in 1999; this facility primarily supplies the East Asian market with elevator switchgear. Finally, at the end of 2013 a works in Ranjangaon/India was



The "beyondSpai" project is addressing the improved protection of the collaboration between man and robots. Optical sensors and special image processing algorithms are to detect human skin and to identify human silhouettes



The modular safety controller PSC1 is suitable for a decentral controller architecture

integrated into the production group. With local production the intention is to meet the requirements of the local markets and to ensure a product programme with globally consistent quality. "As part of internationalisation, today businesses that trade globally expect the same safety standards and control technologies on all their sites", continues S. Rüttger.

Today organisations do not just rely on the expansion of the solution and system business, but also on the intensive provision of advice to customers. For this purpose, at the start of the year a dedicated service division was founded. Trading under the name tec.nicum, training courses and seminars are held and comprehensive consultancy services related to the issues of machine safety and occupational safety are provided, including the technical planning and installation of safety solutions. The worldwide network also offers services such as the customer-specific programming of safety controllers or the safety-related

assessment of existing machines and installations. "We already undertook all these tasks, now they are bundled into a new, dedicated division."

Individual solutions

Increasingly, safety switchgear is specifically adapted to the requirements of the individual sectors, these include the switchgear for packaging machinery manufacture and food technology. Here the organisation in Wuppertal offers components and complete system solutions for almost all types of machinery. Whether tubular bag machine, form-fill-seal machine, blister machine or aseptic filling machine – in the area of primary packaging, the products are also in use in cardboard packers and case packers, labellers and sleeve machines, or in palletisers and stretch-winding machines.

A comprehensive range of safety switchgear meets the high hygiene requirements of the food industry.

As not only the machines, but also the Schmersal devices must be easy to clean and absolutely leak-proof. They are therefore available in degrees of protection IP65, IP67, IP68, IP69K, have a high level of resistance to cleaning agents and disinfectants, and are certified by the European Hygienic Engineering and Design Group (EHEDG).

"Our technology must also function at -25°C as well as at +80°C", says Rüttger. In various forums the organisation is also involved in the preparation of new standards that define, as per European law, how food can be handled, processed and packed under hygienic conditions, using hygienic machinery as well as in perfectly hygienic facilities.

Strong demand

The organisation's best known products to date include the safety interlocks AZ 15 and AZ 16 placed on the market in 1981; according to the organisation's figures more than ten million examples have been manufactured and sold. "Currently the new products in the series AZM are in strong demand", says Siegfried Rüttger in conversation with Verpackungs-Rundschau. Here the solenoid interlock switch AZM300 is significantly different to other switchgear on the market. Due to its innovative interlocking system in the form of a rotating Maltese cross, the interlock can be actuated from three sides and is therefore of universal application. One and the same model can be used on doors hinged on the left and right, as well as on sliding doors. "These switches offer the latest technology for usage in hygienic food processing and are of universal application", says the sector manager.

Making man-robot collaboration safe

The organisation is also a market leader in relation to the ASInterface, the manufacturer-independent, flexibly expandable cabling solution for fieldbus communication. For this purpose Schmersal offers a larger number of items of switchgear.

"AS-i only needs a few cables, permits the connection of various items of switchgear at any point and is already used by many packaging manufacturers.

In this way a complete safety system comprising several components can be connected into a network. We have integrated the technology into our products as an interface and are the manufacturer with the largest range of safety switchgear for the



The solenoid interlock switch AZM300 is significantly different to other switchgear on the market

AS-i system.” As a standardised interface it is available worldwide and therefore is a solution that is already going in the direction of Industry 4.0.

Currently the corporate group is the only project partner from industry supporting a research project at the Bonn-Rhein-Sieg University. The aim of the “beyondSpai” project is to improve protection during collaboration between man and robots in industrial production. Optical sensors and special image processing algorithms are to detect human skin and to identify human silhouettes and in this way to make possible direct and safe interaction between man and robots without guards. “Autonomous, sensor-aided robots, which can control themselves to suit the situation, make it possible to optimise production processes. They make a significant contribution to the realisation of the Industry 4.0 vision. However, the safety of employees in a man-robot collaboration must always be ensured – which is why we are supporting this important research project”,

explains Schmersal General Manager Michael Mandel. For around 15 years, the corporate group has undertaken research and development work in the field of machine safety with robots. One result is the “Safety Controller” that forms a virtual working area.

With the help of the safety controller, the robot monitors its own position and the speed of the axes. If the forces and speeds are low enough and all robot axes remain within a virtual cage, the robot can interact directly with people. With the development of the Safety Controller, Schmersal has laid the foundations for some of the safety strategies currently used by leading robot manufacturers. Together with the Packaging Excellence Center Waiblingen, Schmersal will exhibit solutions for Industry 4.0 at FachPack.

Safety experts

In the field of machine safety, the Schmersal Group is an international market and competence leader. Based on more than 25,000 different items of switchgear, the corporate group offers system solutions for the safety of man and machine. The organisation founded in 1945 now employs 1750 staff worldwide and achieved a total group turnover of around 210 million euros in 2015.

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